Project-Level Conformity Determination - Fine Particulate Matter ($PM_{2.5}$)

Schuyler Heim Bridge Replacement and SR-47 Expressway Project

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Regulatory Background

On March 10, 2006, EPA issued amendments to the Transportation Conformity Rule to address localized impacts of particulate matter: "*$PM_{2.5}$ and PM_{10} Hot-Spot Analyses in Project-level Transportation Conformity Determinations for the New $PM_{2.5}$ and Existing PM_{10} National Ambient Air Quality Standards*" (71 FR 12468). This rule amendment requires the assessment of localized air quality impacts of federally-funded or approved transportation projects in PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas deemed to be projects of air quality concern. This assessment of localized impacts (*i.e.,* "hot-spot analysis") examines potential air quality impacts on a scale smaller than an entire nonattainment or maintenance area. Such an analysis is a means of demonstrating that a transportation project meets Clean Air Act conformity requirements to support State and local air quality goals.

EPA specified in 40 CFR 93.123(b)(1) of the final rule that projects of air quality concern are certain highway and transit projects that involve significant levels of diesel vehicle traffic, or any other project that is identified in the $PM_{2.5}$ or PM_{10} State Implementation Plan (SIP) as a localized air quality concern. According to 40 CFR 93.123(b)(2) and (4), a quantitative analysis for applicable projects is not required until EPA releases modeling guidance in the Federal Register. However, a qualitative hot spot analysis is required.

The qualitative $PM_{2.5}$ hot spot analysis is required to be based on directly emitted $PM_{2.5}$ emissions including tailpipe, break wear, and tire wear, because the direct emissions of $PM_{2.5}$ potentially could cause nearby hot spots. Temporary $PM_{2.5}$ emissions from constructions are not required to be included in the analysis unless the construction activities would take more than 5 year. Secondary $PM_{2.5}$ would be associated with regional impacts and are not required in the project level hot spot analysis.

Project Description

The Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) are proposing to replace the existing Commodore Schuyler F. Heim Bridge (Schuyler Heim Bridge) to meet current seismic criteria. Concurrently, the Alameda Corridor Transportation Authority (ACTA) proposes to construct an expressway along State Route (SR-) 47 or SR-103 to provide a high-capacity alternative route for traffic between Terminal Island and Interstate (I-) 405. The Schuyler Heim

Bridge is located within the City and Port of Long Beach, and Terminal Island is co-located within the Port of Long Beach and Port of Los Angeles. The project is scheduled to be open for traffic in 2011.

The Proposed Action is to improve traffic conditions between Terminal Island and major traffic arterials on the mainland to the north, primarily in the cities of Long Beach and Los Angeles. Six alternatives have been proposed for analysis in an Environmental Impact Statement/ Environmental Impact Report (EIS/EIR) to address the Proposed Action. This project would be classified as a New or expanded highway projects that have a significant number of or significant increase in diesel vehicles 40 CFR 93.123(b)(1)(i). There are four build alternatives, one Transportation Systems Management (TSM) alternative, and one no-build alternative as follows:

Alternative 1: Bridge Replacement and Expressway

This alternative would replace the existing Schuyler Heim Bridge to meet current seismic criteria. It also would construct a new SR-47 Expressway to provide a high-capacity alternative route along the Alameda Corridor for traffic between Terminal Island and Alameda Street, north of Pacific Coast Highway. The Schuyler Heim Bridge is a major traffic route that connects Terminal Island to the mainland cities of Long Beach and Los Angeles. The bridge is located in the City of Los Angeles and passes through property owned by the Port of Long Beach.

With Alternative 1, a new fixed-span bridge would be constructed primarily within the existing bridge right-of-way (ROW) (Caltrans Highway Easement), but toward the east to avoid impacts to the railroad on the Badger Bridge immediately to the west; the existing Schuyler Heim Bridge (a lift bridge) would be demolished. The replacement bridge would be slightly wider (13 meters [m] [43 feet]) than the existing bridge due to the addition of standard shoulders, which the existing bridge does not have. The replacement bridge would include four 3.6-m (12-foot) lanes with 3-m (10-foot) shoulders in the northbound direction and three 3.6-m (12-foot) lanes with 3-m (10-foot) shoulders in the southbound direction. Bridge construction would include a southbound off-ramp and northbound on-ramp at New Dock Street on Terminal Island, as well as a northbound off-ramp and southbound on-ramp at Henry Ford Avenue on the mainland side of the bridge. With this alternative, the new bridge would be supported by four piers in the channel, with a minimum vertical clearance of 14.3 m (47 feet) over the mean high-water level (MHWL). This clearance would be maintained for the width of the navigable channel, which would be 54.9 m (180 feet).

The new SR-47 Expressway would begin on Terminal Island, at the intersection of SR-47 and Ocean Boulevard, extending north over New Dock Street and onto the Schuyler Heim Bridge replacement. A new northbound on-ramp would be constructed from New Dock Street, and a new southbound off-ramp would be constructed to New Dock Street as described above. The expressway would extend northward to Alameda Street, north of the intersection with Pacific Coast Highway, a distance of approximately 2.7 kilometers (km) (1.5 miles). The expressway would be a four-lane, limited access roadway. It would grade-separate five at-grade railroad crossings and three signalized intersections along its length. A segment of the expressway would be constructed as an elevated viaduct over Henry Ford Avenue and Alameda Street and would return to

grade at Alameda Street just south of Pacific Coast Highway. Under this alternative, connectivity to SR-103 would be maintained.

Alternative 1A: Haunch Bridge Design

Alternative 1A is a structural variation of Alternative 1. The main purpose of this alternative is to improve the aesthetics of the replacement bridge over the Cerritos Channel by spanning a greater horizontal distance across the channel between columns. This is accomplished not only by increasing the span lengths over the channel, but also by arching the superstructure soffits (the bottom of the bridge structure). Under this alternative, the new bridge would be supported by two piers (four columns) in the Cerritos Channel compared to four piers (eight columns) under Alternative 1, and the minimum vertical clearance between the piers would be 14.3 m (47 feet). This clearance would be maintained for the width of the navigable channel, which would be 54.9 m (180 feet).

Other aspects of this alternative would be the same as Alternative 1.

Alternative 2: SR-103 Extension to Alameda Street

With this alternative, the existing Schuyler Heim Bridge would be demolished, and a new fixed-span bridge would be constructed. Additionally, modifications to the northbound and southbound approaches to the bridge would be constructed.

Alternative 2 also would extend SR-103 to the northwest on a four-lane elevated viaduct to join Alameda Street between Sepulveda Boulevard and I-405. Improvements to SR-103 would begin approximately 3.2 km (2 miles) north of the Schuyler Heim Bridge and extend a distance of approximately 2.6 km (1.6 miles). The elevated viaduct would cross over the Union Pacific Railroad manual yard and San Pedro Branch, through the Southern California Edison (SCE) utility corridor, across the Los Angeles Harbor Department Warehouse 16/17 area, over Sepulveda Boulevard, then parallel the western boundary of the Intermodal Container Transfer Facility (ICTF) to the centerline of Alameda Street.

The viaduct would slope to grade south of the Wardlow Road ramps to I-405. Improvements would be made to the existing SR-103 to accommodate the southerly and northerly end connections of the viaduct.

Alternative 3: Bridge Avoidance

This alternative would preserve the existing Schuyler Heim Bridge and construct a new fixed-span bridge on an alignment east of the existing bridge. Under this alternative, the new bridge would have the same lane configuration as the replacement bridge for Alternative 1.

This alternative includes seismic retrofit and rehabilitation of the existing Schuyler Heim Bridge, which would remain standing but unused. The retrofit/rehabilitation would avoid demolition of a historic resource and would ensure that the existing bridge would be less likely to collapse. A collapse would result in safety hazards and could damage the new bridge or the adjacent Badger Avenue Bridge.

With Alternative 3, a new SR-47 Expressway would be constructed north of the new fixed-span bridge, as described under Alternative 1, and connectivity with SR-103 would be maintained.

Alternative 4: Bridge Replacement Only

This alternative would replace the existing Schuyler Heim Bridge (lift bridge) with a fixed-span bridge that, for the most part, would be along the existing bridge alignment as described under Alternative 1. The existing Schuyler Heim Bridge would be demolished, as would occur under Alternative 1.

With Alternative 4, no roadway improvements would occur. Therefore, the SR-47 Expressway described in Alternative 1 and the SR-103 extension to Alameda Street described in Alternative 2 would not be constructed.

Alternative 5: Transportation Systems Management

The TSM Alternative would identify low-cost, easy-to-implement improvements as an alternative to construction of more expensive improvements. For this project, the TSM Alternative focuses on improvements to routes that parallel the proposed SR-47 Expressway and that serve the same trips. These trips include drayage trips to and from the ICTF and trips destined to and from the ports via Alameda Street, Henry Ford Avenue, and SR-47. The TSM Alternative would include measures to improve capacity and traffic circulation at the ports through policy changes and use of the latest technologies. With this alternative, capital investment would be minimal compared to the previous alternatives addressed.

The TSM Alternative for this Proposed Action includes the following key elements:

- **Intelligent Transportation Systems (ITS).** System applications would occur in and around the Port area, with special emphasis on truck movements. These include measures to improve traffic circulation through traffic control, incident management, traffic surveillance, and traffic information dissemination with the aid of ITS devices and systems.
- **Lower-cost roadway and intersection improvements.** Measures would include restriping to provide additional turn lanes and acceleration lanes. Also, traffic signalization would be improved, primarily within existing ROWs.
- **Minor roadway widening.** Some roadways would be widened to improve traffic flow. Also, peak-hour parking prohibitions could be instituted to remove midblock bottlenecks along selected roadways.

This alternative would not result in the increased ability of the Schuyler Heim Bridge to withstand a maximum credible earthquake (MCE). In the event of a major earthquake that would render the Schuyler Heim Bridge unusable, only two other access routes pass to and from Terminal Island. The TSM Alternative would not be effective in reducing roadway demand or in rerouting Terminal Island traffic.

This alternative would not result in physical improvement or replacement of the Schuyler Heim Bridge. Therefore, the TSM Alternative would not:

- Provide a link from the mainland to Terminal Island that would ensure ground and vessel transportation immediately following an MCE
- Provide for safety improvements for bridge traffic
- Improve operational or design features of the bridge
- Minimize future maintenance and operational costs of the Schuyler Heim Bridge

Alternative 6: No-Build Alternative

Under Alternative 6, there would be no change to the existing Schuyler Heim Bridge or to the local roadway system. The existing Schuyler Heim Bridge would continue to be seismically inadequate and subject to damage or collapse under strong seismic conditions. Maintenance activities would continue and would include application of protective coatings; lift mechanism repairs; deck resurfacing; and other, similar, maintenance activities. The bridge is expected to continue to deteriorate over time as its useful life is eroded further and as earthquakes of various magnitudes are experienced. At some point in the future, the bridge may need to be demolished and replaced solely to avoid safety hazards.

$PM_{2.5}$ Hot Spot Analysis Method

The proposed action is located in Los Angeles county, which is designated as nonattainment for the federal $PM_{2.5}$ standard and is required to attain and maintain two national ambient air quality standards (NAAQS):

- 24-hour standard – 65 $\mu g/m^3$, and
- Annual standard – 15 $\mu g/m^3$

The proposed action would fall into the category of new or expanded highway projects that have a significant number of diesel vehicles, and would be affecting intersections that are at LOS D, E, or F with a significant number of diesel vehicles. It would be considered as a project of air quality concern based on the criteria listed in the final conformity rule (40 CFR 93.123 (b)(1)). Therefore, a qualitative project-level hot-spot assessment was conducted in order to assess whether the project will cause or contribute to any new localized $PM_{2.5}$ violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

The qualitative $PM_{2.5}$ hot spot analysis was performed following the *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (EPA, March 2006). The analysis was based on directly emitted $PM_{2.5}$ emissions including tailpipe, break wear, and tire wear, because the direct emissions of $PM_{2.5}$ potentially could cause nearby hot spots, or localized areas of elevated concentration. Temporary $PM_{2.5}$ emissions were not included in this analysis because construction would take less than 5 years. Secondary $PM_{2.5}$ would be associated with regional impacts and therefore are not included in a hot spot analysis.

Existing Air Quality of $PM_{2.5}$

The closest monitoring station to the project area is the North Long Beach monitoring station, approximately 5 miles northeast of Schuyler Heim Bridge, which provides ambient air quality data representative of local conditions. As shown in Table 1, the maximum 24-hour $PM_{2.5}$ concentrations measured at the North Long Beach station during the years of 2003 to 2005, inclusive, was 115.2 $\mu g/m^3$ in 2003. The maximum annual concentration (arithmetic mean) for the same time period was 18 $\mu g/m^3$ in 2003. The annual average $PM_{2.5}$ NAAQS was exceeded in all 3 years, and the 24-hour average $PM_{2.5}$ NAAQS was exceeded in 2 of the 3 years. However, the $PM_{2.5}$ concentrations in Long Beach area are declining over the last three years, with a 11% decrease of the annual concentrations, and 5 3% decrease of the 24-hour concentrations. The 24-hour $PM_{2.5}$ NAAQS was not exceeded in 2005.

TABLE 1 $PM_{2.5}$ MONITORING DATA FROM NORTH LONG BEACH STATION

	NAAQS	2003		2004		2005	
	ug/m^3	ug/m^3	Days of exceedance	ug/m^3	Days of exceedance	ug/m^3	Days of exceedance
Highest 24-hr	65	115.2	3	66.6	1	53.8	0
Annual	15	18	Exceed	17.8	Exceed	16	Exceed

Source: Source: CARB, 2006, www.arb.ca.gov/adam/welcome

Ambient air quality in Long Beach is somewhat better than much of the South Coast Air Basin because of its coastal location. It is expected that pollutants would be greatly dispersed after emitting from the sources, because average wind speeds and ventilation near the coast are greater than in the inland areas, and provide better dispersion conditions for the pollutants.

Traffic Condition Improvement by Proposed Action

The purpose of building SR-47 Expressway or the SR-103 Extension along with the SHB replacement is to reduce traffic congestion on local surface streets between Terminal Island and Pacific Coast Highway as well as on I-110 and I-710. The project would also improve traffic conditions by eliminating at-grade railroad crossings and signalized intersections.

Without the proposed action, to connect from Terminal Island to Alameda Street, vehicles must travel 1.5 km (0.9 mi) north from Ocean Boulevard, then exit at the Henry Ford Avenue off-ramp and travel north through local streets, signalized intersections, and railroad crossings for about 2.0 km (1.2 mi) before joining Alameda Street just south of Pacific Coast Highway. Alameda Street continues north of Pacific Coast Highway for 4.0 km (2.5 mi) and connects to the I-405. About 5.5 km (3.4 mi) north of I-405, Alameda Street connects to the Artesia Freeway (SR-91).

The SR-47 Expressway (Alternatives 1 and 1A) would be built upon a network of local streets by constructing a high-capacity expressway connecting the Ocean Boulevard Interchange with Alameda Street at Pacific Coast Highway. When complete, the 2.7 km

(1.7 mi) expressway would provide the missing link between the Ocean Boulevard Interchange on Terminal Island and Alameda Street on the mainland. This link would allow traffic to continue north to connect to Pacific Coast Highway, I-405, and/or SR-91. The proposed expressway would also help maximize use of the recently completed six-lane Alameda Street.

The SR-103 Extension (Alternative 2) is an alternative to the SR-47 Expressway, and would connect existing SR-103, beginning about 0.8 kilometer (km) (0.5 mile [mi]) north of Pacific Coast Highway, to Alameda Street at a point about 0.8 km (0.5 mi) south of the San Diego Freeway (I-405).

Alternative 3 is the bridge avoidance option, and would have the same traffic conditions as Alternative 1. Alternative 4 is the bridge replacement only option which would not affect the traffic conditions compared to the no build alternative. Alternative 5 was not evaluated in this report because no traffic analysis was done for this alternative.

As a result of the proposed action, the delays due to traffic congestion would be greatly reduced and the average vehicle travel speed would slightly increase in the project area. Both of these effects would translate into decrease in vehicle emissions. In 2030, the LOS at the intersections within the project area would be improved by implementing the build alternatives of 1, 1A, 2, and 3. Table 2 compares the PM peak hour intersection conditions of the no build alternative to the build alternatives. Among the 22 intersections analyzed, the LOS of alternatives 1, 1A, and 3 would improve at 8 intersections compared to the no build alternative. The LOS of alternative 2 would improve at 6 of the intersections. Only one intersection of the SR-47/Ocean Boulevard/Pier S Avenue Interchange would have a worse LOS compared to the no build alternative.

TABLE 2: 2030 PM PEAK INTERSECTION CONDITIONS (PCE)

Intersections	No Build (Alternative 6) /Alternative 4	Alternative 1, 1A,3	Alternative 2
SR-47 & New Dock SB Off-Ramp	C	C	C
SR-47 & New Dock NB On-Ramp	C	C	C
SR-47 & Henry Ford Ramps	F	B	C
Henry Ford Ave & Anaheim St	F	E	E
Henry Ford Ave & Denni St	D	C	D
Alameda St & Anaheim St	F	E	F
Alameda St / PCH Connector Ramp n/o PCH	F	F	E
PCH / Alameda St Connector Ramp e/o Alameda St	E	D	C
Alameda St / Sepulveda Blvd Connector Ramp n/o Sepulveda	F	F	E
Sepulveda Blvd / Alameda St Connector Ramp e/o Alameda St	F	E	D
Alameda St / 223rd St Connector Ramp s/o 223rd St	F	F	F
223rd St / Alameda St Connector Ramp e/o Alameda St	E	D	E
223rd St & I-405 SB Ramps	C	B	C
Alameda St & I-405 NB Ramps	C	B	C
Alameda St / Carson St Connector Ramp s/o Carson St	B	B	B

Intersections	No Build (Alternative 6) /Alternative 4	Alternative 1, 1A,3	Alternative 2
Carson St / Alameda St Connector Ramp e/o Alameda St	A	A	A
Alameda St / Del Amo Blvd Connector Ramp s/o Del Amo	C	D	D
Del Amo Blvd / Alameda St Connector Ramp e/o Alameda St	C	D	D
Alameda St & SR-91 EB Ramps	A	A	A
Alameda St & Artesia Blvd n/o Artesia Blvd	A	A	A
Interchagne at Henry Ford	D	D	D
Interchagne at Ocean Blvd	E	F	F

Table 3 shows the daily vehicle miles traveled within the project area for no build and build alternatives. Alternatives 1, 1A, and 3 would have less VMT compared to the no build alternative. There would be approximately 1% increase of VMT for Alternative 2 due to the increase of capacity of the extended SR-103. The truck percentages of the build alternatives are similar to those of the no build alternative within the same year. There would be more port trucks traveling within the project area in 2030 than in 2011.

TABLE 3: VEHICLE PERCENTAGES AND DAILY VEHICLE MILES TRAVELED WITHIN THE PROJECT AREA

	VMT Cars		VMT regional trucks		VMT Port Trucks	
2011--No Build, Alternative 4	4,264,076	86.2%	137,892	2.8%	544,911	11.0%
2011--Alternative 1, 1A, 3	4,258,201	86.6%	138,718	2.8%	522,148	10.6%
2011--Alternative 2	4,296,359	86.3%	140,297	2.8%	543,891	10.9%
2030--No Build, Alternative 4	4,022,781	81.1%	136,185	2.7%	804,315	16.2%
2030--Alternative 1, 1A, 3	4,024,674	81.5%	137,393	2.8%	773,947	15.7%
2030--Alternative 2	4,079,387	81.3%	139,652	2.8%	797,579	15.9%

An emission increase of $PM_{2.5}$ would occur when the project significantly increase the VMT in the project area, and at locations where there are more traffic delays. The delay would be mostly at the intersections where vehicles are accumulating and idling and have worst LOS than the no build alternative. It is unlikely that $PM_{2.5}$ hot spots would be associated with the proposed action because local accumulation and delay of vehicles would be reduced by the project. The proposed action would not increase diesel truck percentages in the project area, and there would be only 1% increase of VMT when implementing Alternative 2. $PM_{2.5}$ emissions increase associated with this slight change of the VMT would be offset by the increase of vehicle speed in the project area, which is an indication of reduced congestion and idling of vehicles. Thus the project is not expected to cause any concern with respect to localized concentrations of PM2.5 (see the following sections for more detailed emission calculations).

In conclusion, from traffic condition point of view, the proposed project would improve the operations of the intersections and increase the vehicle speed in the project area. It is unlikely that $PM_{2.5}$ emissions associated with the proposed action would cause significant adverse impact to the existing air quality.

Direct Operational Emissions - Vehicle Operational Emissions

To further illustrate that the proposed project would not cause significant adverse impact to the ambient air quality, vehicle operation emissions of $PM_{2.5}$ were estimated and compared with the no build alternative. The emission analysis was performed for the entire project study area because the proposed improvements along the SHB, SR-47, or SR-103 corridors would likely affect vehicle traffic patterns on other nearby roads, not just along the roadways with proposed improvements. As a result, traffic conditions and vehicle emissions would be affected by the project in a broader area. The project study area includes the area between Interstates 710, 110, 405, and Ocean Boulevard.

$PM_{2.5}$ emissions from vehicles traveling in the project study area were calculated for the years 2011 and 2030 from VMT projection. Peak hour VMT data of 2011 and 2030 were provided by Meyer, Mohaddes Associates. The 2003 VMT data were estimated based on the traffic volume trends between 2003 and 2030. A sample of 14 intersections was used to assess traffic volumes trends between 2003 (existing conditions) and 2030 (future) conditions. The growth rate at the sample of intersections was determined by comparing the total volumes at these intersections in 2003 and 2030. For 2030, the no-build and Alternatives 1 and 2 scenarios were evaluated. The overall results were consistent between the scenarios, with an average increase of VMT of 63% comparing 2003 traffic to 2030.

$PM_{2.5}$ emissions were estimated for Alternatives 1, 1A, 2, 3, and the no build alternative (Alternative 6). Emission factors for $PM_{2.5}$ were obtained from EMFAC2002 (CARB, 2002). Emissions were calculated based on three major categories of vehicles: autos, heavy duty trucks (regional), and port trucks. Emissions from autos were calculated using EMFAC2002 emission factors representing the Los Angeles County vehicle mix. To be conservative, $PM_{2.5}$ emissions from regional and port trucks were calculated using the EMFAC2002 emission factors of heavy heavy duty diesel trucks. The emission factors selected from the EMFAC2002 results were based on a speed of 26 miles per hour for the no build alternative, and 27 miles per hour for Alternatives 1, 1A, 2, and 3, based on the traffic data provided by Meyer Mohaddes Association.

As shown in Table 4, $PM_{2.5}$ emissions from Alternative 1, 1A, 2, and 3 would be slightly lower than those from the No-Build Alternative. The emission decrease for Alternative 1, 1A, and 3 are due to a predicted decrease in VMT in the study area and increase in vehicle speed for both 2011 and 2030. Although there would be a slight VMT increase of Alternative 2 due to increased capacity from the extension of SR-103, the overall $PM_{2.5}$ emissions of Alternative 2 would still be less than the no build alternative, because the emissions due to VMT increase are offset by the effects of vehicle speed increase, and resulted a net decrease of emissions. In addition, emissions in Table 4 were estimated based on the average vehicle speed estimated for the entire project area, which is a conservative estimate.

Emissions of Alternative 4 are predicted to be the same as those for the No-Build Alternative because their VMT and vehicle mix in the project area is predicted to be the same. Emissions associated with Alternative 5 were not discussed in this analysis because there is no traffic information available for Alternative 5.

Overall, when compared to the no build alternative, $PM_{2.5}$ emissions would be the same or less than the build alternatives. In addition, the emissions in 2030 would be much lower than those in 2011 (project opening year), attributed to the addition of newer vehicles with greater emission controls in future years. Based on the current ambient $PM_{2.5}$ concentrations in the project area, the project is not expected to have significant localized $PM_{2.5}$ concentration increase compared to no build alternative. The proposed action is unlikely to cause new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS. Therefore, the project meets the conformity hot-spot requirements in 40 CFR §93.116 and §93.123 for $PM_{2.5}$.

TABLE 4 DAILY VEHICLE PM $_{2.5}$ EMISSIONS FOR THE PROJECT STUDY AREA

Project Alternative	2003 PM $_{2.5}$ (lb/day)	2011 PM $_{2.5}$ (lb/day)	2030 PM $_{2.5}$ (lb/day)
No Build	819	637	418
Alternative 1, 1A	__	608	400
Alternative 2	__	622	408
Alternative 3	__	608	400
Alternative 4	__	637	418

Indirect Operational Emissions – Marine Vessel Emissions

The replacement of the existing lift-span of the Schuyler Heim Bridge with a fixed-span bridge would have indirect impacts on local air quality by affecting the marine traffic. Replacing the lift-span bridge with a fixed span bridge would force taller marine vessels to take a longer route around the Cerritos Channel and would delay vessels with adjustable mast heights. The increased trip times for the marine vessels would result in increased $PM_{2.5}$ emissions.

Emissions of $PM_{2.5}$ were assumed to be the same as $PM_{10,}$ and were calculated using the *Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data* (EPA, 2000) in conjunction with forecasted delay and detour travel times (CH2M HILL, 2005a). The detour hours during operation of the Schuyler Heim Bridge after 2011 are the same, based on the assumption that the marine traffic would not increase in future years (CH2M HILL, 2005).

Daily emissions resulting from marine vessel detours during operation of the proposed fixed-span Schuyler Heim Bridge, are displayed in Table 5. Detailed emission calculations are shown in Appendix J.

TABLE 5: INDIRECT $PM_{2.5}$ EMISSIONS FROM MARINE VESSELS

Ship Type	Worst-Case Daily Detour Hours During Operation (hours/day)	$PM_{2.5}$ (lb/day)
Tugs	3.53	2.18
Harbor Operations	0.08	0.06

Ship Type	Worst-Case Daily Detour Hours During Operation (hours/day)	$PM_{2.5}$ (lb/day)
Fishing	0.02	0.003
Yachts	0.76	0.20
Tankers	0.02	0.03
Total		**2.5**

The $PM_{2.5}$ emissions associated with the marine vessel detour are estimated to be 2.5 pounds per day. For Alternatives 1, 1A, 2, and 3, this emission increase would be offset by the emission decrease associated with the improved traffic conditions within the project area. Therefore, indirect emissions of $PM_{2.5}$ would not cause any new violation of the NAAQS at the project area.

For Alternative 4, the emission increase would mostly occur at the outer harbor area where the ships were rerouted, which would be further away from the harbor and any sensitive receptors nearly. The emissions would also be offset at some level by eliminating the vehicle idling emissions at the bridge by building the fixed span bridge. In addition, the marine vessel emissions would be rapidly diluted and dispersed at this coastal area. Combined with the declining background concentrations of $PM_{2.5}$ in the project area, this minimal emission increase is not expected to significantly increase the ambient $PM_{2.5}$ concentration in the project area to cause any new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the $PM_{2.5}$ NAAQS.

PM2.5 Regional Impact

Similarly, regional impacts from PM2.5 associated with a transportation project would be unlikely if that project were included in the RTIP and regional air quality analysis conducted for the AQMP/SIP, both of which were found to meet regional conformity requirements. It is also unlikely that the project would cause a regional air quality impact for PM 2.5 because the analysis conducted for the AQMP/SIP for ozone attainment would be similar to the analysis required for secondary PM2.5 formation, and progress toward attainment of the standard would be achieved.

The Schuyler Heim Bridge/SR-47 project is consistent with the 2004 RTP adopted by SCAG and is included in the 2004 RTIP. Both of these have been found to conform with the SIP. The regional air quality impacts would be less than significant.

References:

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